

14 washing away the second chemical agent in the higher solubility areas, thereby to
15 produce the screen-printing stencil.

1 36. A method according to claim 35, wherein the first chemical agent is produced *in*
2 *situ* by reaction between two or more precursor materials, separately applied to the image-
3 receiving layer, prior to contact with the stencil forming agent, at least one of which is
4 applied in the said areas corresponding to the blocked areas of the stencil to be produced.

1 37. A method according to claim 35, wherein the image-receiving layer of the
2 receptor element reacts with the first chemical agent to produce lower solubility areas
3 corresponding to the said blocked areas and excess of the first chemical agent remains in said
4 areas to react with the second chemical agent upon contact between the image-receiving layer
5 and the stencil-forming agent, whereby the respective lower solubility areas of the image-
6 receiving layer and of the stencil-forming layer combine with one another and, after the
7 higher solubility areas are washed away, remain to form the blocked areas of the screen-
8 printing stencil.

1 38. A method according to claim 35, wherein the image-receiving layer comprises at
2 least one polymers selected from the group consisting of methyl hydroxy propyl cellulose,
3 carboxymethyl cellulose, polyvinylpyrrolidone and polyacrylic acids.

1 39. A method according to claim 35, wherein the image-receiving layer comprises
2 paper.

1 40. A method according to claim 38, wherein the polymer(s) is/are present in the
2 image-receiving layer in a total amount of 5 to 100 wt % of the image-receiving layer.

1 41. A method according to claim 40, wherein the image-receiving layer contains at
2 least one material selected from the group consisting of fillers, binders and plasticisers.

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42. A method according to claim 37, wherein the image-receiving layer comprises one or more of the polymers selected from the group consisting of polyvinylalcohol and its derivatives; gelatin and its derivatives; carboxylated polymers capable of becoming water soluble on addition of alkali; water-soluble cellulose derivatives; sulphonated polymers; polyacrylamides; epoxy resins; and amino resins.

43. A method according to claim 42, wherein the image-receiving layer comprises, as a said carboxylated polymer, a carboxylated acrylic polymer.

44. A method according to claim 42, wherein the image-receiving layer comprises, as a said carboxylated polymer, an ethylene-acrylic acid copolymer.

45. A method according to claim 42, wherein the image-receiving layer comprises, as a said carboxylated polymer, a styrene-acrylic acid copolymer.

46. A method according to claim 42, wherein the image-receiving layer comprises, as a water-soluble cellulose derivative, starch.

47. A method according to claim 42, wherein the image-receiving layer comprises, as a water-soluble cellulose derivative, hydroxypropyl cellulose.

48. A method according to claim 42, wherein the image-receiving layer comprises, as an amino resin, a urea-formaldehyde resin.

49. A method according to claim 42, wherein the image-receiving layer comprises, as an amino resin, a melamine-formaldehyde resin.

50. A method according to claim 42, wherein the image-receiving layer comprises polyvinyl alcohol with a degree of hydrolysis of from 20 to 99.9 mole %.

1 *Sub 32* 51. A method according to claim 42, wherein the image-receiving layer comprises
2 *cms* polyvinyl alcohol with a degree of polymerisation of from 100 to 3500 mole %.

1 52. A method of claim 35 wherein the receptor element includes a support base.

1 53. A method according to claim 52, wherein the support base is from 10 to 200µm in
2 thickness.

1 54. A method according to claim 53, wherein the support base comprises at least one
2 material selected from the group consisting of polyethylene terephthalate, polyethylene,
3 polycarbonate, polyvinyl chloride, polystyrene and coated paper.

4 55. A method according to claim 48, wherein the image-receiving layer has a
5 thickness of from 0.1 to 50 µm.

1 56. A method according to claim 35, wherein the image-receiving layer has a
2 thickness of from 6 to 250 µm.

1 57. A method of claim 35, wherein the second chemical agent comprises one or more
2 of the polymers selected from the group consisting of polyvinylalcohol and its derivatives;
3 gelatin and its derivatives; carboxylated polymers capable of becoming water soluble on
4 addition of alkali; water-soluble cellulose derivatives; sulphonated polymers;
5 polyacrylamides; epoxy resins; and amino resins.

1 58. A method according to claim 57, wherein the second chemical agent comprises, as
2 a said carboxylated polymer, a carboxylated acrylic polymer.

1 59. A method according to claim 57, wherein the second chemical agent comprises, as
2 a said carboxylated polymer, an ethylene acrylic acid copolymer.

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60. A method according to claim 57, wherein the second chemical agent comprises, as a said carboxylated polymer, a styrene-acrylic acid copolymer.

61. A method according to claim 57, wherein the second chemical agent comprises, as a water-soluble cellulose derivative, starch.

62. A method according to claim 57, wherein the second chemical agent comprises, as a water-soluble cellulose derivative, hydroxypropyl cellulose.

63. A method according to claim 57, wherein the second chemical agent comprises, as an amino resin, a urea-formaldehyde resin.

64. A method according to claim 57, wherein the second chemical agent comprises, as an amino resin, a melamine-formaldehyde resin.

65. A method according to claim 35, wherein the active component(s) of the first chemical agent comprises at least one member of the group consisting of boron salts; boric acid; aldehydes; isocyanates; isocyanate derivatives; carbodiimides; carbodiimide derivatives; transition metal compounds; transition metal complexes; aziridine; aziridine derivatives; amines; multifunctional silane compounds; N-methylol compounds; and active vinyl compounds.

66. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises one or more Group I or Group II metal borates.

67. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises formaldehyde.

68. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises a dialdehyde.

69. A method according to claim 68, wherein the dialdehyde is glyoxal.

70. A method according to claim 68, wherein the dialdehyde is glutaraldehyde.

71. A method according to claim 68, wherein the dialdehyde is activated by treatment with mineral acid.

72. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises toluenediisocyanate.

73. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises 1,3-dicyclohexylcarbodiimide.

74. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises pentahydroxy (tetradecanoate) dichromium.

75. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises pentahydroxy (tetradecanoate) dichromium derivative.

76. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises silicon tetraacetate.

77. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises dimethylolurea.

78. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises methyloldimethylhydantoin.

79. A method according to claim 65, wherein the active component(s) of the first chemical agent comprises 1, 3, 5-triacryloyl-hexahydro-s-triazine.

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1 80. A method according to claim 35, wherein the active component(s) of the first
2 chemical agent constitutes from 0.5 to 100 wt.% of the first chemical agent.

1 81. A method according to claim 36, wherein the first chemical agent precursor
2 applied in the areas corresponding to the blocked areas of the stencil to be produced
3 comprises a reactive dialdehyde and a further first chemical agent precursor is a dilute acid.

1 82. A method according to claim 81, wherein the reactive dialdehyde is water-soluble.

1 83. A method according to claim 82, wherein the dialdehyde is glyoxal.

1 84. A method according to claim 82, wherein the dialdehyde is glutaraldehyde.

1 85. A method according to claim 81, wherein the dilute acid is an acid which lowers
2 the pH to 4 or less when mixed with the dialdehyde.

1 86. A method according to claim 85, wherein the acid is hydrochloric acid.

1 87. A method according to claim 85, wherein the acid is citric acid.

1 88. A method according to claim 35, wherein the first chemical agent is applied
2 dropwise to the receptor element.

1 89. A method according to claim 88, wherein the dropwise application is by an ink-jet
2 printer having at least one ejection head.

1 90. A method according to claim 88, wherein the dropwise application is by an ink-jet
2 plotter having at least one ejection head.

1 91. A method according to claim 89, wherein the ink-jet printer has more than one
2 ejection head.

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1 92. A method according to claim 90, wherein the ink-jet plotter has more than one
2 ejection head.

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1 93. A method according to claim 35, wherein the first chemical agent is supplied to
2 the receptor element by a hand-held delivery device.

1 94. A method according to claim 35, wherein the stencil is further toughened by a
2 post-treatment using further chemicals.

1 95. A method according to claim 35, wherein the stencil is further toughened by a
2 post-treatment using actinic radiation.

1 96. A method according to claim 35, wherein the stencil is further toughened by a
2 post-treatment using heat.

1 97. A method according to claim 94, wherein the further chemicals are resident in the
2 image-receiving layer.

1 98. A method according to claim 94, wherein the further chemicals are resident in the
2 stencil-forming agent.

1 99. A method according to claim 94, wherein the further chemicals are applied image-
2 wise.

1 100. A method according to claim 94, wherein the further chemicals include an
2 aqueous base.

1 101. A method according to claim 100, wherein the base is potassium carbonate.

1 102. A method according to claim 35, including a further, reclaim step.

Sub 32 Cont. 103. A method according to claim 102, wherein the first chemical agent comprises a borate and the reclaim is carried out at a pH of 4 or less.

1 104. A method according to claim 35, wherein the second chemical agent is applied to
2 the screen printing screen from one side thereof after the receptor element has been applied
3 to the other side thereof with its image-receiving layer in contact with the screen, whereby the
4 image-receiving layer is brought onto contact with the second chemical agent.

1 105. A method according to any of claim 35, wherein the second chemical agent is
2 applied to the screen printing screen and the receptor element is subsequently brought into
3 contact with the screen to bring the image-receiving layer thereof into contact with the second
4 chemical agent.

1 106. A method according to claim 35, wherein any support base present is removed
2 before washing away the second chemical agent in the higher solubility areas.

1 107. A method according to claim 35, wherein any support base present is removed by
2 the washing away of the second chemical agent in the higher solubility areas.

1 108. A screen-printing stencil produced by the method of claim 35.

1 109. A method of screen printing comprising the steps of:
2 providing a screen-printing stencil according to claim 108,
3 placing the screen-printing stencil in contact with a substrate, and
4 passing a printing medium through the open areas of the stencil to produce printing on
5 the substrate in areas corresponding to the open areas of the stencil.

1 110. A substrate printed by the method of claim 109.